IFT 203/CSC 211 : Introduction to Web Technologies

Department of Information Technology

Faculty of Computing and Information Technology

Osun State University,Osogbo

LECTURE 1
2025/2026 session

DR. O.E OJO

Course Contents

- Introduction to the internet, the World Wide Web (WWW), and web development. WW as a platform for interactive applications, content publishing, and social services.
- The role of HTTP and HTTPS in the context of web applications. Roles and operations of web browsers and the web server. Interacting with web applications through forms, and using style sheets to separate document structure and document formatting.
- Web development tools and frameworks. Build a simple website that: organises information effectively, uses valid HTML and CSS, and applies appropriate web standards from standards bodies such as W3C. HTTP communication protocol, the mark-up languages HTML,
- XHTML, and XML, the CSS and XSLT standards for formatting and transforming web content. Interactive graphics and multimedia content on the web, client-side programming using JavaScript. Impact of the World Wide Web on people's lives over time.

Lecture 1: Introduction to the Internet and the World Wide Web.

Definition and evolution of the Internet

Internet

- It is the largest network in the world that connects hundreds of thousands of individual networks all over the world.
- The popular term for the Internet is the “information highway”.
- Rather than moving through geographical space, it moves your ideas and information through cyberspace, the space of electronic movement of ideas and information.

What is the internet

- **Internet** is a global system of interconnected computer networks that use the standard Internet protocol (often called TCP/IP) to serve billions of users worldwide. It is a network of networks that consists of millions of private, public, academic, business, and government networks, of local to global scope, that are linked by networking technologies.

Evolution of the internet

- the **history of the Internet** begins with the development of electronic computers in the 1950s.
- The US Department of Defense awarded contracts as early as the 1960s, including for the development of the ARPANET project.
- The first message was sent over the ARPANET in 1969 from computer science laboratory at University of California, Los Angeles to the second network at Stanford Research Institute (SRI).

Who Owns the Internet?

- There are many organizations, corporations, governments, schools, private citizens and service providers that all own pieces of the infrastructure, but there is no one body that owns it all. There are, however, organizations that oversee and standardize what happens on the Internet and assign IP addresses and domain names, such as the National Science Foundation, the Internet Engineering Task Force, ICANN , InterNICand the Internet Architecture Board.

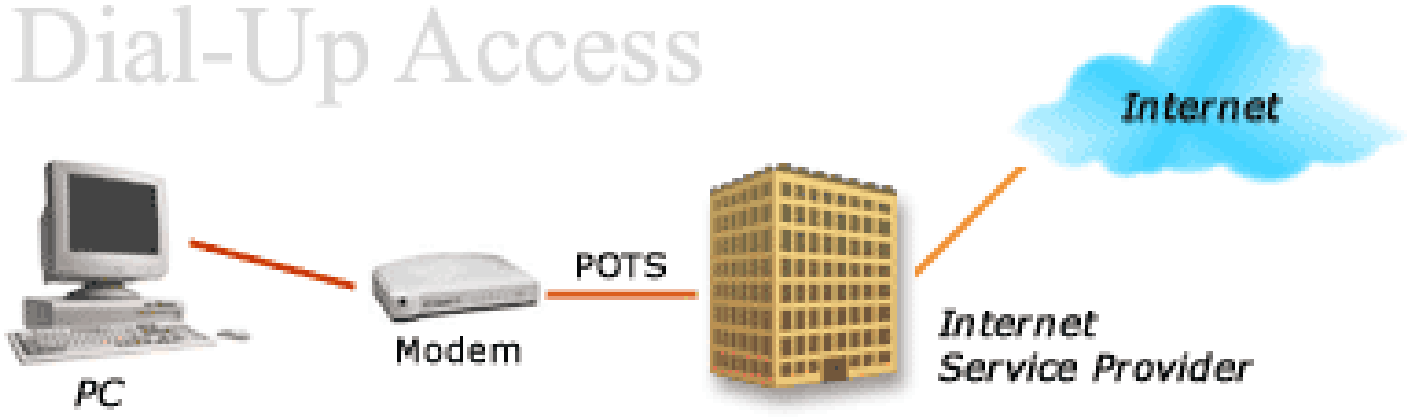
Internet Connections

- There are many ways a personal electronic device can connect to the internet. They all use different hardware and each has a range of connection speeds:
  1. Dial-Up (Analog 56K).
  2. DSL
  3. Cable
  4. Wireless
  5. Satellite
  6. Cellular

1.Dial-Up

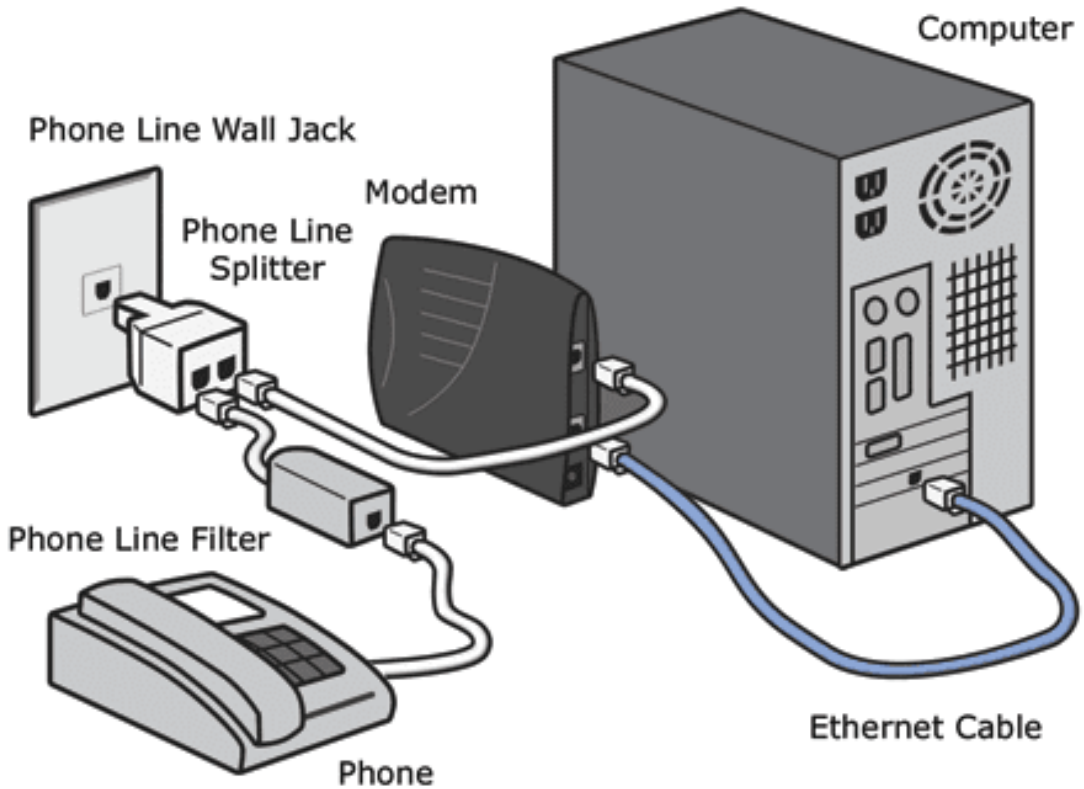
- Dial-up access is cheap but slow.
- A modem connects to the Internet after the computer dials a phone number.
- This analog signal is converted to digital via the modem and sent over a land-line serviced by a public telephone network.
- Telephone lines are variable in quality and the connection can be poor at times.
- The lines regularly experience interference and this affects the speed.
- Since a computer or other device shares the same line as the telephone, they can’t be active at the same time.
- Speed: 28K to 56K

Dial-Up Access



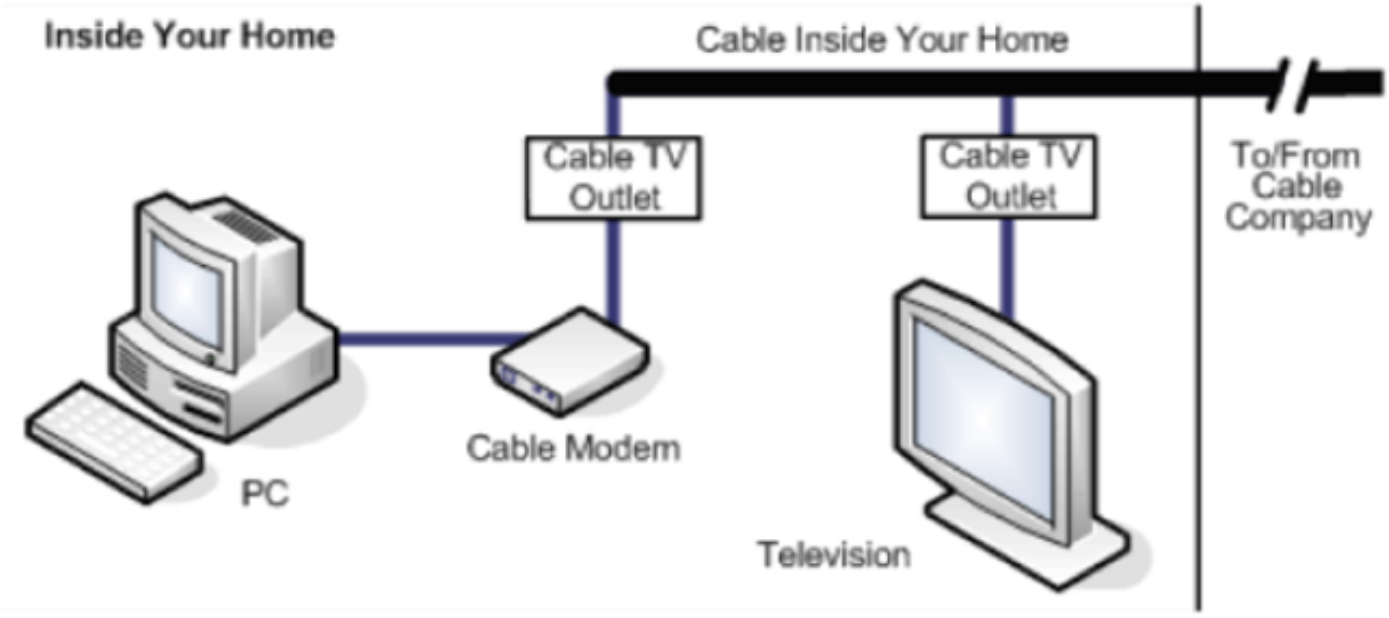
2. DSL

- DSL stands for Digital Subscriber Line.
- It is an internet connection that is always “on”.
- uses 2 lines so your phone is not tied up when your computer is connected.
- There is also no need to dial a phone number to connect.
- DSL uses a router to transport data.
- Speed: 128K to 8 Mbps


Computer
Phone Line Wall Jack
Modem
Phone Line
Splitter
Phone Line Filter
Phone
Ethernet Cable

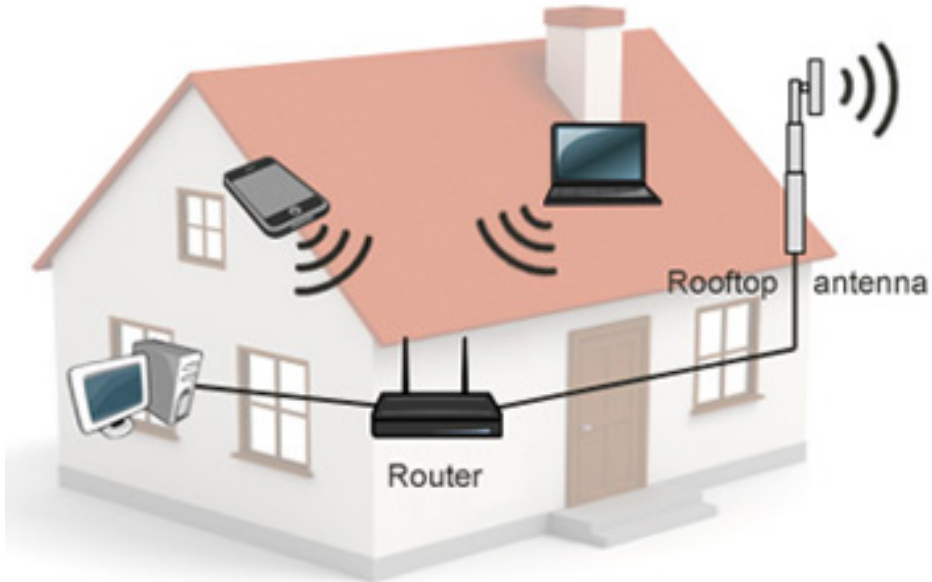
3. Cable

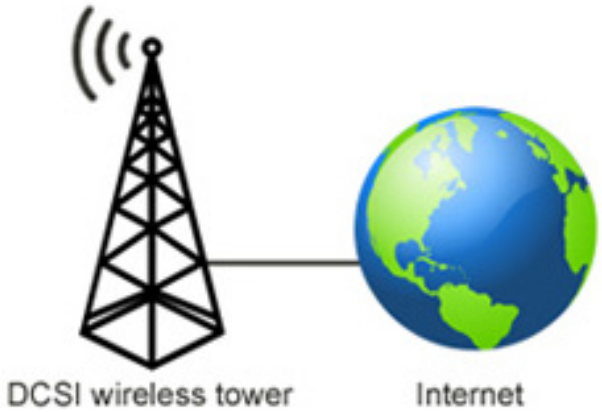
- Cable provides an internet connection through a cable modem and operates over cable TV lines.
- There are different speeds depending on if you are uploading data transmissions or downloading.
- The coax cable provides a much greater bandwidth over dial-up or DSL telephone lines.
- Speed: 512K to 20 Mbp.


Inside Your Home
Cable Inside Your Home
Cable TV Outlet
Cable TV Outlet
To/From Cable Company
PC
Cable Modem
Television

4. Wireless

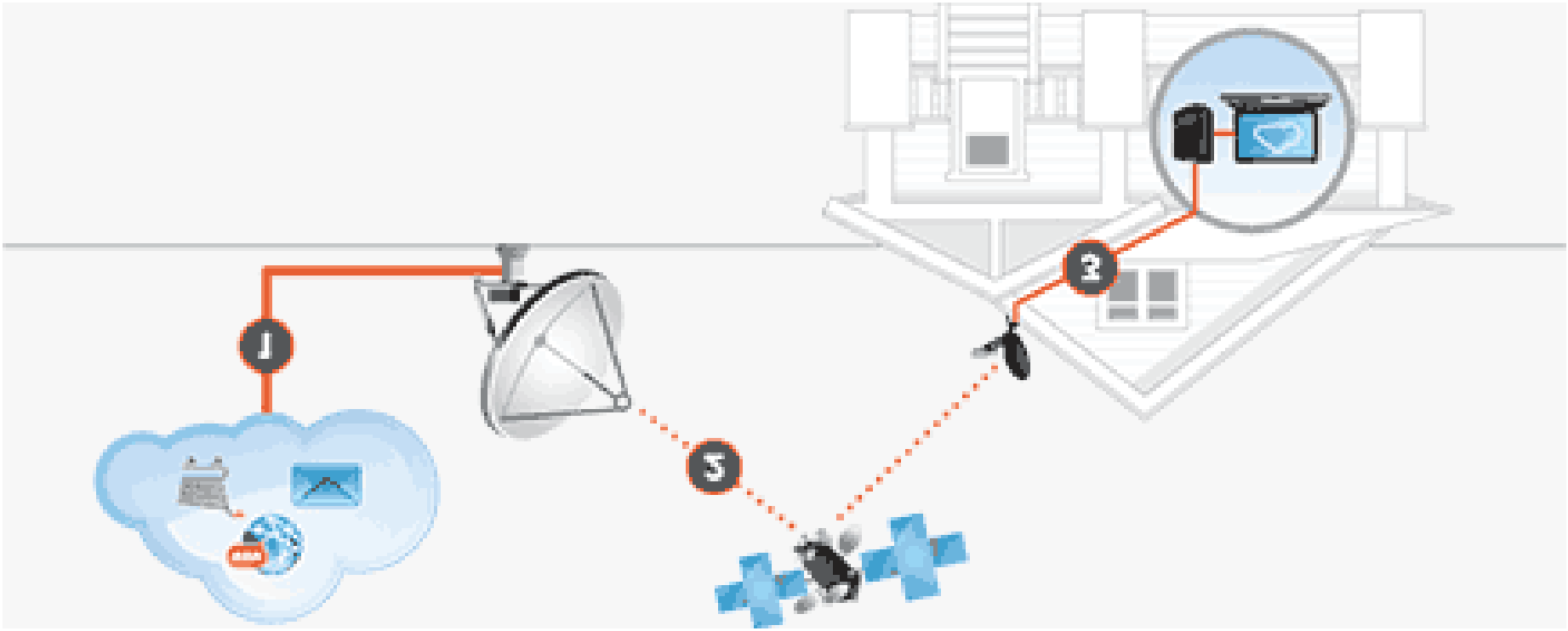
- Wireless, or Wi-Fi, does not use telephone lines or cables to connect to the internet.
- It uses radio frequency.
- Wireless is also an always on connection and it can be accessed from just about anywhere.
- Speed: 5 Mbps to 20 Mbps.


Rooftop antenna
Router


DCSI wireless tower
Internet

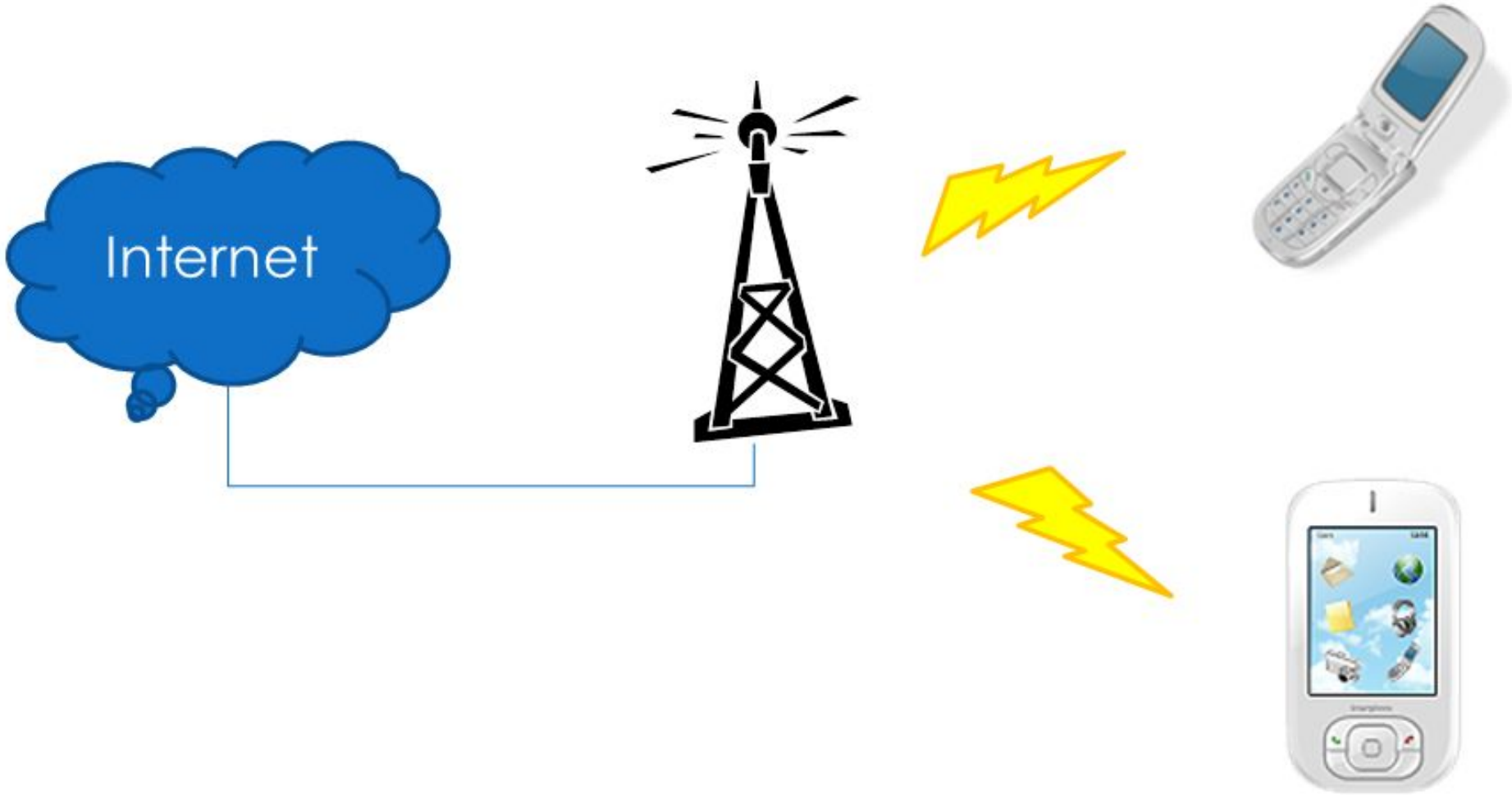
5. Satellite

- Satellite accesses the internet via a satellite in Earth’s orbit.
- The enormous distance that a signal travels from earth to satellite and back again, provides a delayed connection compared to cable and DSL.
- Speed: 12K to 2.0 Mbps


1
2
3

6. Cellular

- **Cellular.** Cellular technology provides wireless Internet access through cell phones. The speeds vary depending on the provider, but the most common are 3G and 4G speeds. A 3G is a term that describes a 3rd generation cellular network obtaining mobile speeds of around 2.0 Mbps. 4G is the fourth generation of cellular wireless standards. The goal of 4G is to achieve peak mobile speeds of 100 Mbps but the reality is about 21 Mbps currently.


Internet

Advantages of the Internet

- you can send and receive e-mails
- you can get in touch with your friends
- you can do shopping
- you can downloads files, music and films
- you can find interesting materials
- you can meet/get to know a lot of people
- you can find flat or jobs quickly
- the net is easy and fast source of information
- the net makes our work easier
- the net enables us to do shopping, pay bills without leaving our homes
- the net saves our time (we don’t have to stay in queue)
- provides entertainment
- And much more…..

Disadvantages of the Internet

- Although the Internet is one of the greatest creations, it also has many disadvantages. Because the internet is easily accessible to anyone, it can be a dangerous place.
- You have to know who you're dealing with or what you're getting into. Predators, cyber criminals, bullies, and corrupt businesses will try to take advantage of the unwary visitor.

Disadvantages of the Internet

- Bullying, trolls, stalkers, and crime
- Exploitation and pornography and violent images
- Addiction, time waster, and causes distractions
- Never being able to disconnect
- Identity theft, hacking, viruses, and cheating
- Spam and advertising
- Depression, loneliness, and social isolation
- Health issues and obesity
- Buying things not needed

Concept of the World Wide Web (WWW)

What is Web?

- The **Web (World Wide Web)** consists of information organized into Web pages containing text and graphic images.
- It contains hypertext links, or highlighted keywords and images that lead to related information.
- A collection of linked Web pages that has a common theme or focus is called a **Web site**.
- The main page that all of the pages on a particular Web site are organized around and link back to is called the site's **home page**.

How to access the Web?

- Once you have your Internet connection, then you need special software called a browser to access the Web.
- Web browsers are used to connect you to remote computers, open and transfer files, display text and images.
- Web browsers are specialized programs.
- Examples of Web browser: Netscape Navigator (Navigator) and Internet Explorer.

Client/Server Structure of the Web

- Web is a collection of files that reside on computers, called **Web servers**, that are located all over the world and are connected to each other through the Internet.
- When you use your Internet connection to become part of the Web, your computer becomes a **Web client** in a worldwide client/server network.
- A **Web browser** is the software that you run on your computer to make it work as a web client.

Hypertext Markup Language (HTML)

- The public files on the web servers are ordinary text files, much like the files used by word-processing software.
- To allow Web browser software to read them, the text must be formatted according to a generally accepted standard.
- The standard used on the web is Hypertext markup language (HTML).

Differences between the Internet and WWW

INTERNET	WWW
The Internet is a global network of interconnected systems	WWW stands for World wide Web.
Internet is a means of connecting a computer to any other computer anywhere in the world.	World Wide Web which is a collection of information which is accessed via the Internet.
Internet is infrastructure.	WWW is service on top of that infrastructure.
Internet can be viewed as a big book-store.	Web can be viewed as collection of books on that store.
Internet is primarily hardware-based.	WWW is more software-oriented as compared to the Internet.
Internet is superset of WWW.	WWW is a subset of the Internet.
The first version of the Internet was known as ARPANET.	In the beginning WWW was known as NSFNET.
Internet uses IP address.	WWW uses HTTP.

Introduction to web development and web applications

Web Development

- Web development refers to building, creating, and maintaining websites. It includes aspects such as web design, web publishing, web programming, and database management. It is the creation of an application that works over the internet, i.e., websites.

- There are two major areas: Frontend and Backend which forms the backbone of web development each plays a crucial role in creating seamless, functional web experiences.

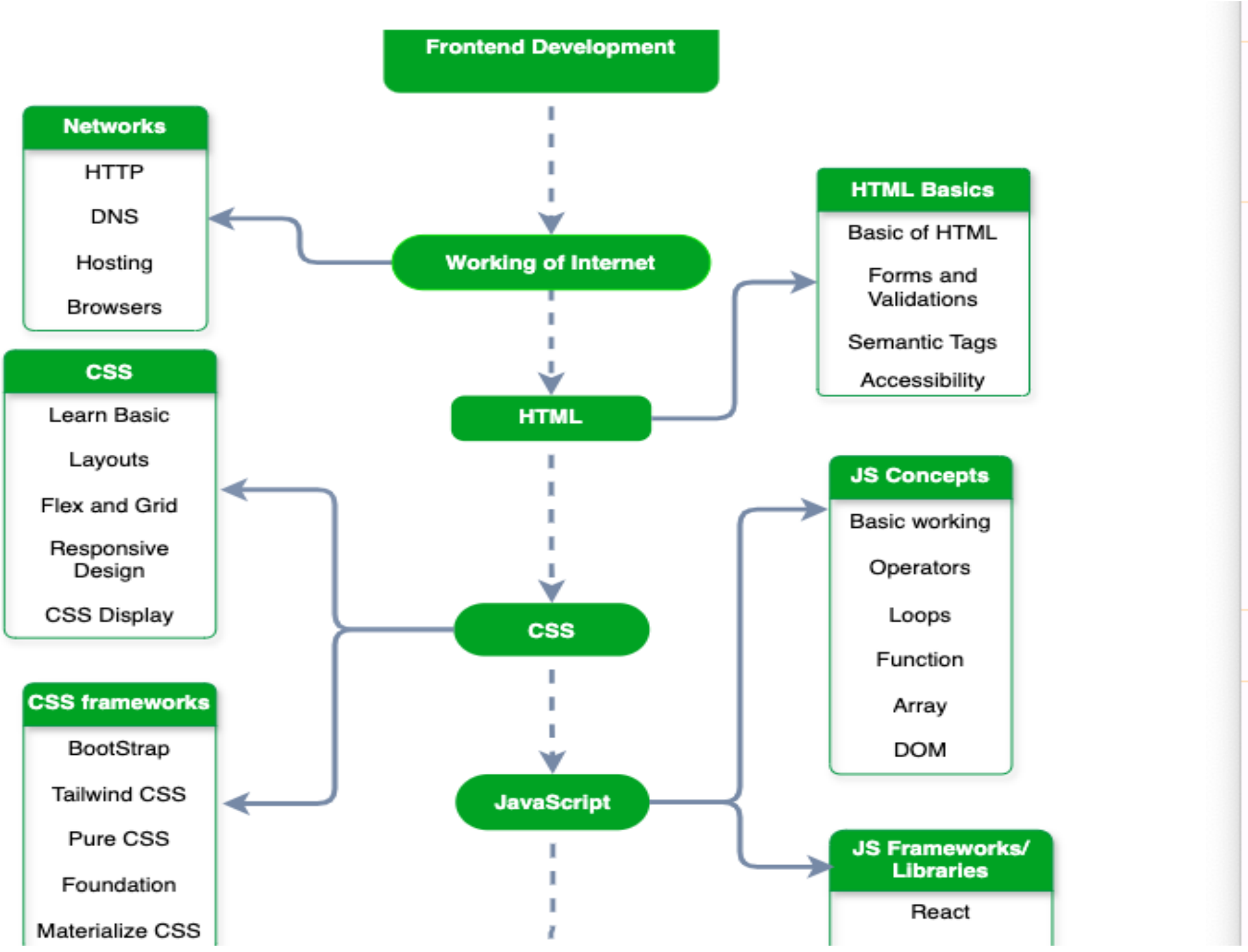
Frontend Development

- The core technologies that run in the user's browser, the client side, including how web pages are structured, styled, and made interactive, building everything users see and interact with.

- HTML (HyperText Markup Language): HTML is the language used to create the basic structure and content of web pages. It uses elements, tags, and attributes to organize text, images, and links.

- CSS (Cascading Style Sheets): CSS is used to style the HTML content. It controls colors, fonts, layouts, and how the page looks on different devices. More importantly, CSS enables you to do this independent of the HTML that makes up each web page.

- JS (JavaScript): JavaScript adds life to web pages by making them interactive. It handles things like buttons, animations, and form checks.


Frontend Development
Networks
HTTP
DNS
Hosting
Browsers
Working of Internet
HTML Basics
Basic of HTML
Forms and Validations
Semantic Tags
Accessibility
HTML
CSS
Learn Basic
Layouts
Flex and Grid
Responsive Design
CSS Display
CSS
JS Concepts
Basic working
Operators
Loops
Function
Array
DOM
CSS frameworks
BootStrap
Tailwind CSS
Pure CSS
Foundation
Materialize CSS
JavaScript
JS Frameworks/ Libraries
React

Backend Development

- The technologies that work behind the scenes on the server to handle data, run the website, and store information.
- Some popular languages used to build the back end of web applications:

1. JavaScript/Node.js: JavaScript is a popular programming language mainly used to add interactivity on the client side (in browsers). With Node.js, JavaScript can also run on the server side. Node.js is an open-source environment that allows JavaScript to build fast, scalable back-end services like APIs. Many big companies like PayPal, Uber, and Netflix use Node.js for their server-side code.

2. PHP: PHP is a server-side scripting language designed specifically for web development. Since PHP code executed on the server-side, so it is called a server-side scripting language.

3. Python: Python is a programming language that lets you work quickly and integrate systems more efficiently.

Backend Development

4. Ruby: An object-oriented programming language designed to be simple and natural to use. Ruby helps developers write clean and readable code.

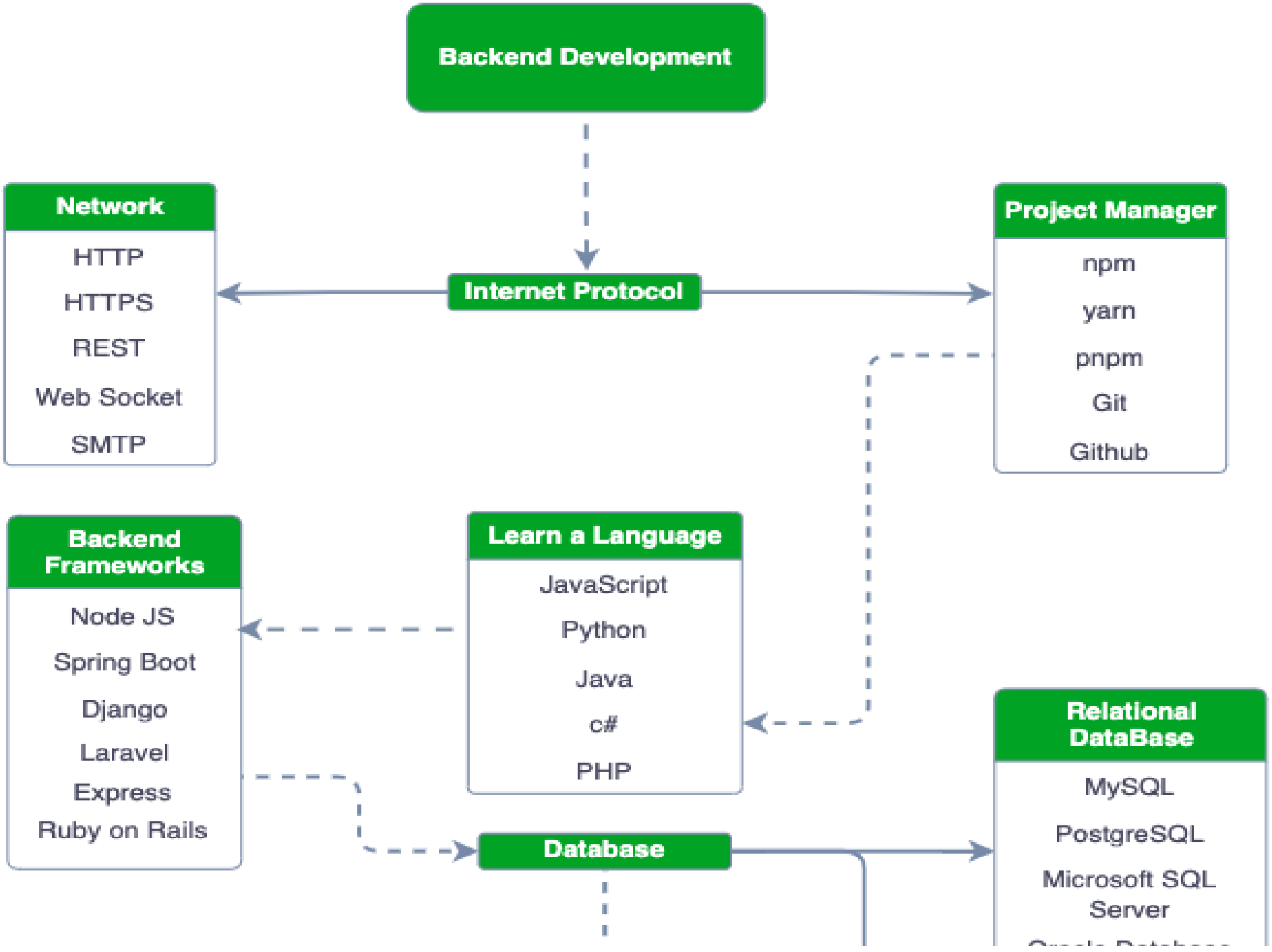
5. Java: Java is one of the most popular and widely used programming languages and platforms. It is highly scalable. Java components are easily available.

6. Golang(Go): Golang is a procedural and statically typed programming language having the syntax similar to C programming language. Sometimes it is termed as Go Programming Language.

7. C#: A modern, object-oriented language often used to build web applications on Microsoft platforms.

Databases

- A database is where a website’s data like user's data, product's data are stored and organized.
- It is part of the backend (server side) that manages and keeps this information safe.
- Websites use databases to save and access information like user details, content, and transactions.
- Some databases organize data in tables (called relational databases, like MySQL),
- while others store data in flexible formats (called NoSQL databases, like MongoDB).


Backend Development
Network
HTTP
HTTPS
REST
Web Socket
SMTP
Internet Protocol
Project Manager
npm
yarn
pnpm
Git
Github
Backend Frameworks
Node JS
Spring Boot
Django
Laravel
Express
Ruby on Rails
Learn a Language
JavaScript
Python
Java
c#
PHP
Database
Relational DataBase
MySQL
PostgreSQL
Microsoft SQL Server